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who have availed themselves of the facilities it affords. In amount and character of its biological work the Johns Hopkins University has but few rivals in America, and it is safe to say that at least half of its prominence and prestige in this respect is due to the work done in its marine laboratory.

There is ample evidence that there is an increasing realization of the importance of these summer schools in connection with university instruction. Anything which should tend to lessen the present number would be deplorable. There should be more of them, and more money for their support. Not all institutions have the wealth or have trustees with the breadth of view necessary for the establishment of such stations; and yet similar facilities should be enjoyed by all. In such cases the deficiency should be met either by co-operation or by hiring tables at some established laboratory. As it now is, except the Johns Hopkins Laboratory and that of the United States Fish Commission, all of these stations are supported by individual efforts. The time, however, cannot be far distant when there will be more of these laboratories which will bear an intimate relationship to our colleges and universities. When that time comes biological instruction will be of a higher character, and the biological sciences will take a higher rank in the public estimation than they now do.

RECENT LITERATURE.

Review of Dr. H. Rink's Paper on the East Greenlanders.[1]—The following article is based on a consideration of the interesting conclusions deduced by Dr. Rink in his admirable paper on the East Greenlanders.

The first subject to be considered is the conclusion expressed concerning the original home of the Eskimo.

That Dr. Rink finds evidence tending to confirm the hypothesis that Alaska is the scene of their origin, and supports the statement in the fact that the Eskimo are not strictly confined to the littoral portions of Alaska, but on the mainland thrust themselves along the more important rivers to a greater or less distance, which is in each instance determined by the limit of trees, approaching the coast, along the river-banks. Along the Kuskokvim and the Yukon Rivers a slight allowance should be made for the constant maintenance of trading-stations situated favorably to induce both the Indians, who dwell in the northern regions, strictly within tree-limits, and the Eskimo, who dwell without it, to trade at those stations.

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[1] Die Ostgrönländer in ihrem Verhältnisse zu den übrigen Eskimostämmen. Von H. Rink. Deutsche geographische Blätter, vol. ix., No. 3, 1886, pp. 228–239.

In three localities the Alaskan Eskimo are known to disperse far into the interior. The first area to be considered is that lying between the Yukon from near the Shgeluk across to the Kuskokvim at Kolmakofsky Redubt and to the sea. This great expanse of barren ground is quite populous with Eskimo. The second and third areas are adjacent, and comprise the region lying east of Kotzebue Sound. Here are the mountain Eskimo and, to the north of them, the Eskimo along the banks of the Kuwuk and several other streams of greater or less importance. The occurrence of these people in each of those localities can certainly form no hypothesis that will tend even to support the assertion that their presence away from the coast should show their origin.

Dr. Rink submits the strange deduction that the Eskimo kaiak is a derivative of the Indian birch-bark canoe. From the earliest accounts every particle of reliable information proves that the most deadly hatred and animosity existed between the Indians and Eskimo wherever they came in contact. Their earlier history is filled with traditions of scarcely credible atrocities practised by each people upon the other; and any one who believes the possibility of the birch-bark canoe being adopted as a model by the Eskimo for his skin canoe has but little knowledge of the contempt of the Eskimo for anything of Indian construction.

Just why the word *umiak* was not substituted and that model considered instead of the birch-bark canoe is incomprehensible. That the umiak is the original of the kaiak is proved by the tradition now existing among the people of Attu, the westernmost island of the Aleutian Chain, and where the writer lived for eleven months.

The narrative is, in substance, as follows: We always had the umiak as a boat for general purposes, used as a vessel for a community or several families. Later, when strife became common, the umiak was made smaller, and only a man and his own family entered it and made it their home for days at a time. They were thus exposed to the inclemency of the weather, and a cover was made over the front as a protection for the family. The place of the man was now drawn nearer the centre, and that left space behind in which could be stored the effects that also required protection. By the act of covering at each end a small space was finally left in which the man could sit, and it was then found that the accompanying members of the family were unnecessary to comfort and speed.

A shaman, who had attained a degree of reverence from his people and whose decree was law, decided that the women and children should no longer accompany the man in the covered boat, and that the length of the vessel should be that of the fin of the large whale; hence the development of the kaiak, which is essentially a vehicle employed by the men, and not by women and children.

That the kaiak reaches a higher stage of perfection in certain localities depends upon the environment and the means at hand. The clumsiest kaiaks are doubtless those of the region lying between the south side of the Yukon Delta and south to Cape Newenham, on the north shore of Bristol Bay, Alaska. Here the struggle for existence precluded the possibility of devoting time and mental labor in evolving such a craft as is to be found on the shores of Kotzebue Sound and in the perfection of the Greenlander's skin canoe.

The various patterns of construction, as shown by a cross-section of the kaiaks from several localities, indicate that the form is adapted as much to the particular local wants as, perhaps, to the mental scale of the people of each region. The scarcity or the abundance of material for construction of the framework has evidently had nothing to do with the degree of perfection attained, for at the mouth of the Kuskokvim River an unlimited supply of wood may be obtained, while on the west shore of Baffin's Strait or on the shores of Greenland the supply of wood is necessarily limited from the condition of the position.

Traders in Alaska never employ a birch-bark canoe when undertaking a journey, except it be far inland, where if a three-holed kaiak were used and became damaged or worn it could not be repaired for the lack of material (skin) and a knowledge how to perform the work upon a skin canoe. At all of the lower stations where seal-skin is obtainable the kaiak of three holes is employed exclusively, and never the birch-bark canoe. It is rare indeed to find a two-holed kaiak on the mainland waters. Many writers, however, contend that the two-holed kaiak is of prehistoric origin. Such statements are not warranted by facts presented.

The two-holed and the three-holed kaiaks are of Russian invention, and are used only in the sea-otter regions of Alaska or where the sea-otter formerly ranged. The construction of the two-holed kaiak was due to the Russian promish leniks, or, as there intended to mean, the leaders of a hunting-party, who had need for as many men and as few kaiaks as possible when waging war with the neighboring people. It was not a difficult stride to evolve a two-holed kaiak from that having one hole, and after that to create one with three holes in order to accommodate some high functionary who desired to travel in state while two men propelled the affair.

It was afterwards found that so many men had been killed that youths must be employed to take the place in the rear hole in order that the hunter could cast his dart at the sea-otter, now made doubly wary by the energetic pursuit of it from the increasing number of rival fur companies. As that creature was restricted to certain portions of Alaska, the use of the two-holed kaiak has never gone beyond those limits. The convenience of the three-holed kaiak has made it an accompaniment of the white trader wherever he has gone and been able to procure the skins with which to cover it.

The width of the umiak precluded the probability of the double-bladed paddle being thought of; hence, as the Indian seldom employs the double blade in propelling his birch-bark canoe, it is not difficult to believe that the single paddle was first used and the double blade was devised by an accidental loss of the single paddle, and that the double paddle was evolved from a stick taken from the load of fuel then being carried on the top of the kaiak, which was found to be so effective that its improvement and adoption certainly required but little mental strain.

That some of the Eskimo do not employ the double paddle is well known, and due probably as much through choice as by anything else. Let it be as it may, the art of turning over the kaiak and the occupant righting himself is a diversion practised only where the double-bladed paddle is in common use, and not by all the people using it as a means of propulsion. The Aleuts employ the double-bladed paddle exclusively, and the mainland Eskimo, with the Kadiak Innuit, employ the single blade to as far north as the upper portion of Norton Sound, where an occasional double paddle is used. As far as the mouth of the Mackenzie the single and the double blade are in use through individual or circumstantial preference. East of the latter place the double-blade paddle appears to be the one used exclusively by the Innuit wherever found.

In regard to the development of the various spears, darts, javelins, and other projectiles cast by the use of the arm and the hand-board, Dr. Rink considers them to be developments of the arrow.

The hand or arm was certainly the power to guide and cast a spear or dart long before the flexibility of wood was applied as a means to produce direct motion by the release of a shaft from a string used to create the tension of the bow, even in its crudest condition. If this be true, it is far more probable to conclude the opposite of the deduction inferred by the remarks of Dr. Rink.

If the various projectiles used as means to obtain creatures from the sea, lake, or stream are modifications of the arrow, as understood to be the missile sent from a bow, then it would appear that those weapons now recognized as arrows and everywhere used for land-shooting, except a few instances where the hunter stands on land and sends that shaft into an object in the water, or where a particular form of arrow is used to transfix a fish while the operator stands in a boat, are the most primitive of all projectiles. It is scarcely credible that such should be the case when all probability points to the simplest form of javelin as the original, and that the arrow is a modification of that weapon.

The bird-spear with three or four divergent prongs on the forward end is certainly an older weapon than the one having that number of prongs situated or affixed near the central part of the wooden shaft. The simple shaft with a single point, or with the later-devised toggle-point, is also an old projectile. The bird-spear having the prongs near the centre of the shaft is then a combination of the original forms of the simple spear and the trident bird-spear.

This combination happily effected the purpose of two weapons in one; for if the kaiaker observed a flock of birds, the combination projectile afforded means of securing them, while if a seal or other mammal thrust its head above the surface of the water, the same instrument, with its shaft of ivory having dentate edges, could be employed to pierce its skin and result in its capture by the hunter, who in these emergencies needed but a single weapon.

It is not, however, uncommon to find the three prongs, or even four prongs, with a central shaft, which is always shorter and subordinate to the long, divergent ones, used for hand-throwing at birds or for transfixing a fish. This form is more commonly reduced in size and employed as an arrow to be projected by the use of a bow of short length, and projected while the kaiaker sits in his skin canoe. The low position of the occupant interferes, however, with the use of the bow while so sitting; hence the employment of that missile did not come into general use.

Some of the projectiles employed by the Eskimo to capture mammals, birds, and fishes have feathered vanes. The material which is used to form the head on the wooden shaft is of such nature that it will curve or distort if not kept at an even temperature. The object of the feathering at the opposite end is to obviate the rotation of the projectile and to produce certainty and steadiness of flight and prevent twisting caused by the curvature of the forward end of the shaft. In other words, the feather-vanes produce the opposite of that which the rifling of a gun is intended to effect. When an Eskimo discovers an object which will afford food or raiment he has no time to lose in nicely adjusting his missile with regard to the curve of the bone or ivory head. It will be readily understood that those weapons which are projected by the bow and the hand-board are the only ones which have feather-vanes attached to them. The feathers for the shafts employed to secure aquatic creatures are taken only from water-fowl, while the feathers that vane the arrows used to slay land creatures are procured only from land birds. In some localities the feathers of the raven form an exception. Those projectiles which are to be cast by the hand alone never have feather-vanes attached to them, and in many localities the feathering is discarded on the shafts thrown by the hand-board.

In regard to the supposition that the custom of wearing labrets in the lip of the Eskimo is due to and derived from the Indians (Thlinkets) dwelling south of them, this is a conclusion based upon an erroneous conception of the facts in the case.

That the custom of wearing labrets, or lip-studs, is fast disappearing among the Eskimo is not a remarkable thing in itself. An almost entire revolution in customs and manners of far greater significance is not uncommon among nations or peoples farther advanced in our idea of the scale of civilization, or an approach to it. Certainly that those customs which are of least advantage would be the earlier discarded will not be denied by any one. The same remarks are well applicable to the practice of tattooing, which in the eastern regions is not at all general, and in some localities has almost disappeared; yet one of the most profusely tattooed individuals the writer ever saw was an Eskimo woman at Fort Chime, Ungava; other women there were unmarked by tattooing. This remarkable instance was due simply to the fancy of the individual performing that operation upon a subject who had no will in the matter, and for that reason should not be taken into sufficient consideration to form a theory or a generalization on. Yet how unfortunate for science if an exploring expedition had touched at a locality where this woman and her husband had happened to be the only ones of the Innuit of the region seen and she be the subject of an elaborate discussion, which a fertile mind would generalize into a universal custom!

To return to the custom of wearing the labret, or lip-stud. It seems just as probable that the practice of perforating the lip and inserting a piece of stone, bone, or ivory had its origin in the east, and that they should be the first to discard it and the western Eskimo the last to relinquish it. It is a well-recognized fact among those people that the labret seriously interferes with the chewing of tobacco, for the stud must be removed, and this permits the saliva to flow from the orifice. This flow freezes in winter and results disastrously to the person. Hence the love of ornamentation has been subordinated to the gratification of an acquired habit of a character originating but recently. The very abruptness in the Mackenzie region of wearing the lip-stud tends to prove that the lack of intercommunication between the widely-separated people termed Eskimo has served to perpetuate the custom to the westward.

That the Thlinket should originate a custom now adopted by the western Eskimo is scarcely borne out by a consideration of other facts that may be adduced to prove the contrary. The form and position of the Thlinket lip-stud is not copied by any of the Innuit. The latter perforate the lip directly under the corner of the mouth, while the former pierce the median line of the lower lip.

All of the traditions, legends, and speech of the western Innuit point to an eastern origin, and that the route lay by the sea and northern land. Their extension southward was partly a matter of choice and as much so of necessity. When they came in contact with the Thlinket and ceased their wandering, why should not the Thlinket as a propitiatory measure have adopted a custom of the Innuit, but modify the position and form as well as go only half-way and wear but one lip-stud?

In regard to the material of construction, form of the dwellings, and the disposition of the fireplace, Dr. Rink advances some arguments which should be taken into consideration.

A tradition exists among the Unalit of Norton Sound to the effect that the ancestors of the present people constructed dwellings of sod, earth, and stones, when each of those materials was at hand. Now the greater portion of the western Eskimo dwell in fixed habitations composed of logs set on end or laid one above the other to a sufficient height and banked nearly to the eaves with dirt. The convenience of the material employed is evident; hence the transition from the former character of dwelling to that of the present needs no discussion. The position of the fireplace in their present habitations is that tending to an economy of space and for the convenience of the occupants. The light-hole, which forms also the place of exit for the smoke of the fire within, is placed in the centre of the roof, so that the rays of light may diffuse themselves equally on all sides of the room within, while if the fire were built at one side the smoke-hole would be placed directly over it, and this would tend to cause crowding around that particular portion in order to obtain the advantage of the most light in the short days of the long winter.

The form of the house is consistent with the character of the material used in its construction. Rough-laid stones without cement or mortar would tend to fall if arranged in walls to form a square or oblong; but if the arrangement be circular or dome-shaped, then the pressure would be equal on all parts; and where the material is of sufficient firmness to withstand a crushing strain, the best adapted form is that of the dome.

The common snow hut of the eastern and northernmost Innuit is constructed on that principle, for the simple reason that no other form would support the weight. This shape tends to prevent additions or intercommunicable chambers, except of a less specialized character; and not until the use of wood was adopted do we find that several chambers or dwellings are so placed as to cluster on at least three sides about the original structure, which insures by this arrangement additional protection and proximity. There are many facts to adduce in support of the clustering character of the dwellings, but as they involve so many considerations, a discussion of them will be deferred for another occasion.

Where wood is scarce and large pieces are met with but few times in the course of an Eskimo's life, those few large pieces are reserved to furnish him with props or supports for his tent in summer, or for the frame of his umiak, or the shafts of his spears and other necessities, which are greater to him than fuel to cook his food or to make warmth. There the turf or stone-walled hut is the kind of dwelling, while the snow hut is from its nature a winter edifice only.

The Eskimo of Southern and Western Alaska know of the snow hut only by tradition. Only in the extreme northern part of Alaska do we begin to find the snow-blocks employed as material from which to construct a dwelling; thence eastward the use of that substance is common as far as the Eskimo extend.

None of the Eskimo south of Hudson Strait erect permanent dwellings for themselves, with the exception of those directly and continually in contact with the white people (missionaries) of Labrador. The only shelters are the skin tent and the snow hut. In many places there are traces of former habitations of stone and turf; the two materials having been apparently combined, for the disposition of the ruins indicates an insufficient quantity of either material by itself. Instead of the huge *kazhguk*, or "club-house," of the western Innuit, a large, oblong space is walled with blocks of snow, and within the inclosure repair those who participate in the festivals and dances commemorative of the return of the sun from the south. At the same season the practice of distributing presents to the living in honor of the dead also takes place; but as this latter ceremony occurs only every fourth year in any locality, the honoring of the dead and change of names is held previous to the dances, in propitiation of the light-giving principle.

A discussion of the linguistic affinities and the correlation of the myths, legends, traditions, and beliefs, which go far in the character of the Innuit, will be deferred for a separate article.

To Dr. Rink the legion of ethnologists cannot fail to express their admiration of his description of research and the practical advantages to be gained therefrom; and it is earnestly hoped that the publication of the entire results of the recent expedition to the locality of the East Greenlanders will not be long delayed. —*L. M. Turner*, *Smithsonian Institution*, April 11, 1887.